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ABSTRACT

Described is a program which attempts to prepare teachers in a fashion that approximates the instructional setting which is expected in science classrooms utilizing the Intermediate Science Curriculum Study (ISCS) programs. It is specifically designed to support the in-service preparation of ISCS teachers. It includes two basic categories of modules: (1) content modules, providing background in specific subject areas; and (2) teaching strategy modules, dealing with the methodology of individualization and specific teaching behaviors. The Individualized Teacher Preparation (ITP) modules focus on evaluation of student progress, carrying out effective inquiry, helping students adjust to their role in individualization, and organizing the classroom for individualization. The production and dissemination of these materials are described in this paper. The Project has organized a network of area field consultants to aid in organizing in-service efforts using the ITP modules. This network of consultants ranges across the continental United States. Informal feedback from settings where the materials are being used reflect that the modules are well received by teachers and teacher educators. Suggested changes or improvements are listed. (EB)

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INDIVIDUALIZING IN-SERVICE TEACHER PREPARATION FOR ISCS TEACHERS

NARST SYMPOSIUM PAPER
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Being an ISCS teacher means abandoning the conventional role that is associated with group instruction. It means stepping down from the pedestal of teacher autonomy and getting out there among the youngsters. It means mentally struggling with individual students and attempting to guide them in their pursuits of science subject matter and process knowledge. It means relinquishing some traditional teacher authority in order to pass along to each student the primary responsibility for managing his own learning environment. And being an ISCS teacher means counseling more than telling, guiding more than leading, encouraging more than demanding.

Obviously for many teachers, such a set of tasks requires a significant role-change. And some teachers need much assistance in achieving the new behaviors that must be displayed if successful implementation of an individualized instructional program such as the Intermediate Science Curriculum Study is to occur.

At the heart of the ISCS effort to provide the teacher with help in making the role transition to individualization is the development of the Individualized Teacher Preparation modules designed to be used in an in-service instructional setting at the local school level. These modules reflect the belief that if teachers are to support individualized instruction and if they are to be adequately prepared to implement such a program, they must encounter a training program which itself is individualized. This argument follows from the often-heard statement that teachers teach as they have been taught. The ISCS-ITP program is an effort to prepare teachers in a fashion that approximates the

instructional setting which they will be expected to establish in their own science classrooms.

In addition to being concerned with the style of instruction which the teachers will encounter as they learn to adapt to the ISCS program, the Project has also been concerned with providing a way for local school systems to achieve a continuing in-service program for teachers new to individualized instruction. Therefore, the Project has produced a package of materials as a basic core for an extended in-service training effort.

At the same time, the Project has not ignored those institutions of higher learning which support summer institute programs and which are heavily engaged in preservice teacher preparation. Though the ITP program is specifically designed to support the in-service preparation of ISCS teachers, it includes many practical suggestions for a more general implementation of individualized instruction. A specific look at the nature of the modules will perhaps point up the reasons that ISCS feels its product has significant generalizability to teacher preparation interests other than ISCS.

Two Kinds of Modules

There are two basic categories of modules in the ITP program. One group of modules deals with the specifics of the subject matter and process content of the ISCS three-year program. The sequence of activities, the content and process themes for each level and each unit within levels, and the key transitional elements from level to level and unit to unit within levels are all treated in a significant way in the content-centered modules. Thus, the content modules hopefully provide background for teachers in the specific subject area in which they will be dealing and in the distinctive features applicable to the ISCS setting.

In addition to the content modules, there are also teaching strategy modules. These deal specifically with the methodology of individualization and with the specific teaching behaviors that characterize an individualized setting. The purpose of these modules is to prepare the teacher to handle the variety of pedagogical situations that he will encounter in the setting of an individualized classroom. The modules focus on key problems such as evaluating student progress, carrying out effective inquiry, helping students adjust to their role in individualization, and organizing the classroom for individualization.

Both the strategy and the content modules are being used in settings other than ISCS. For example, content modules are being used in preservice training of elementary teacher. Strategy modules, or at least portions of them, are being used rather extensively in a variety of methods courses cutting across curricular boundaries of science, social studies, and so on.

Individualizing Instructional Modules

To achieve the maximum individualization of teacher preparation with the modular program, each module has been prepared so that it is essentially independent of the other modules. Each one carries with it its own particular performance objectives which are reflected in self-evaluation materials appearing in the module. And each modul consists of core and excursion material, lending further to the ITP program's similarity to the ISCS student materials. The function of the core chapters and separate excursions is to provide teachers with opportunities to do different kinds of things and to satisfy different kinds of personal needs as they prepare for ISCS instruction.

The core of each strategy module is that material which the developers, teachers, and evaluators of ISCS feel is likely to be of importance to each person beginning as an ISCS teacher, whether he will be teaching Level I, II, or III. The excursion materials are designed for more specific needs of

teachers, depending upon the level with which they will work and their own past experience in the individualization of instruction. Of course, some teachers require significantly more assistance than others as they seek to become familiar with the science subject matter and the science inquiry processes of the program.

Each module provides opportunities for the teacher to proceed at his own rate. As he goes through the program, he encounters activities, questions, and problems which are similar to, but often more complex than, those found in the student materials. In this way, the teacher becomes familiar with the role of the student and the problems that students will face as they proceed through their own set of instructional materials.

Teachers are using the modules in a variety of settings. As mentioned earlier the modules have shown themselves to be useful in preservice classes, summer institutes, and in-service settings. Some teachers who are in isolated situations are working with the modules in the privacy of their own classrooms; however, the modular program has been designed for optimum implementation in an in-service setting with a relatively small group of teachers interacting on a scheduled encounter basis. There are certainly benefits in interacting with colleagues. Furthermore, the small-group, in-service setting provides an environment which is more like the kind of environment the teacher will encounter in implementing the student program.

Generally, the modules to be studied for any given level of the ISCS program should require approximately 40 to 50 hours of the teacher's time. This is, we feel, a reasonable amount of time to spend in preparing for the program. And, of course, this preparation can be spread out over many weeks during the school year. One could hardly recommend that prior to teaching ISCS a teacher study in great detail all elements of those modules which relate

to his specific needs. Instead, the Project strongly recommends that the modular package be viewed as a set of resources to which the teacher may turn for help as he encounters the various problems that characterize the ISCS individualized setting.

In summary, the ITP program provides teachers with an opportunity to study the modules at their own best pace, to select those parts of the module they consider pertinent, and even to decide for themselves which modules best suit their specific needs. Furthermore, the sequence of modular study has a great deal of flexibility. There is a logical sequence for the use of the content modules that relate to a specific grade level of ISCS, but otherwise teachers are free to do the modules in the order which they feel is most applicable to their immediate needs. In this way, each teacher is basically in charge of the sequence of this program of study.

Materials Production and Dissemination

The production and dissemination of materials such as those described in the preceding has proven to be fully as large a task as was the development of the three-grade-level student program. Modules had to be developed in parallel and the total set of materials that would eventually be made available for any one teacher had to be large enough to meet his special needs and provide alternatives for his selection. And at the same time, the basic survival materials must not require too many hours of in-service work. The modules had to be written for adults, a new chore for staff seasoned in writing student materials. The content modules were not to serve the function of a teacher's guide, and yet they should focus the experience of the teacher so that he would easily recognize in the student materials the same sequence that he had followed in the set of modules

for his particular grade level. A very serious constraint on the staff had to do with the experience differential that characterizes middle-junior high school science teachers. If ITP were to be a program to serve the nation's schools, little could be taken for granted about the teacher's background. The decision was to shoot at a low content sophistication at the risk of offending the better prepared teacher in favor of the less prepared one.

The entire production of the ITP modular program was done in-house. That is to say, from the first draft of author materials, some of whom joined the staff as consultants in residence, through multiple typings, subsequent drafts, editorial, and artwork -- all originated within the Project. The final product was the camera-ready copy that went directly to the printer. We had learned long before that in-house production of multiple texts demands careful sequencing of production activities. Harsh deadlines were established. Frantic efforts to revise tested modules kept all the staff hopping.

The dissemination of the Individualized Teacher Preparation program has been a relatively easy task. The network of consultants and field representatives established by the Project early in its development of student materials served effectively in this dissemination. Area representatives of the publishing company responsible for the ISCS program established contact with schools that had accepted the student program and who were already clamoring for assistance in the training of its teachers. The word about the modular program spread quickly and in many cases, requests for materials arrived well in advance of their availability. Summer institutes,

CCSS institutes, and locally run in-service efforts provided the mechanism for initiation of teachers to the ITP modules.

Implementation

Some school systems move very slowly in implementing new programs. Others, perhaps are too quick to accept new ideas. In both situations, a respected person, knowledgeable of a new program can provide much needed assistance in the planning and organizing stages that precede implementation. To serve this purpose, the Project has organized a network of area field consultants. Their primary function is to aid in organizing in-service efforts using ITP. This network of consultants ranges across the continental United States.

To back up the work of the field consultant and the director of in-service training within the local system, ISCS is developing a final module entitled *Designs for Implementing ISCS*. Its purpose is to provide specific but alternative suggestions for conducting in-service sessions using the ITP modules.

In suggesting a philosophy of implementation for the student materials and the teacher training modules, the Project encourages its consultants and the school systems with which they work to view these programs as prepresenting a set of carefully prepared resources from which a program that best suits the needs of the system may be developed. We recommend that the initiation of the student materials follow the basic sequence that has been developed by the Project. However, it is clear that with regard to both student and teacher materials, in the long run, the decision for their use and their sequencing will be made by the local system in keeping with its special needs and its defined goals and objectives.

Evaluation

A formalized and carefully controlled evaluation of the ITP materials has proven to be virtually impossible given the limited resources and staffing of the Project. Furthermore, even though the program has not been designed to be all things to all people, it has been developed to provide a great deal of selectivity to a wide variety of people in different settings. The evaluation of the program's success in preparing teachers for the role they will accept depends on examining the outcome of its use in these many settings. So far, informal feedback from many of these settings where materials are being used reflects the following: (1) that the modules are well received by teachers and teacher educators, (2) that the basic format and design of the materials has been acceptable to the teachers, (3) that some teachers feel that the level of sophistication of some of the modules is beneath them and that others feel them a bit too sophisticated, (4) that certain strategy modules tend to be favored over others (e.g., the module on classroom organization has received the widest use of all others), (5) that leaders of in-service efforts using the modules need an additional module related to problems of implementing the ITP program (This module is under preparation now by the Project staff.), (6) that elements of some modules are considered busy work by some, and (7) that strategy modules are favored over content modules.

Some critics of the program suggest that even more flexibility of use should have been part of the design. Others say the ITP program is the most significant contribution the Project has made to science teaching in the schools.